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ABSTRACT

A model of parent involvement in computer education is discussed in relation to activities of the Computer Discovery Project at the Center for Young Children, University of Maryland. Content focuses on parents' attitudes and concerns about the use of microcomputers in educational settings. Growth in parents' involvement with computers is documented and is reported to be largely due to a policy allowing parents to take microcomputers and software home over weekends. In addition, the design of a research project to assess parents' evaluation of software is described. Pilot study findings have indicated that opinions of parents vary widely on the value of each piece of software used and that preferences for particular programs are evident. Concluding remarks describe other school/community outreach programs, including (1) the Community-Classroom Computer Connection Program, which emphasizes the need to coordinate the use of home technologies with school activities and goals; and (2) the "Playing to Win" project, which offers computer experience at correctional facilities, public libraries, and to parents and children living in lower socioeconomic housing in East Harlem. (RH)

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The Evolution of an Effective Home-School Microcomputer Connection

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Abstract:

The roles that parents and teachers play in the young child's development have been studied extensively. A brief look at the findings related to the education of the "disadvantaged" children, thus identified in the the United States in the 1960's, offers several paradigms which may be applicable to the challenge of preventing "computer illiteracy" in the 1980s. Models of home-school-community interaction are reviewed which introduce the microcomputer as a tool with which parents and children can explore together, learn together, and gain self esteem together.

This paper was presented at a Working Conference sponsored by the International Federation of Information Processing (IFIP) on "The Computer in the Home: Its Challenge to Education", April, 1986, in Interlaken, Switzerland.

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Historical Perspective

Parents have always played a part in the education of their children. Unfortunately many parents do not realize that they are their child's first and, perhaps most important, teacher. Parents' participation in the physical development of the child is obvious for it is they who encourage the child to walk, talk, take solid food, etc. But the parents' participation in the child's learning should be much greater than just physical development. By exposing the child to many experiences using the neighborhood and community as an educational resource and verbally mediating the environment, parents facilitate concept formation which then becomes the basis for more abstract learning in school. In addition to this cognitive dimension, there is an emotional/attitudinal factor which parents, perhaps unknowingly, bestow upon their children from the time of their birth. This dimension includes self concept, expectations, and feelings about the importance (or non-importance) of learning. All this education has occurred before the child enters school.

Because teachers are required to have specialized training and degrees, some parents perceive them as "The Educators" and yield the total responsibility for education of the young to them. Likewise some teachers assume that they have all the answers to a child's educational needs rather than seeing the educational process as a home/school partnership. In the early part of the 20th century in the United States, parents were

encouraged to have a "Hands-Off" policy as far as the schools were concerned. In some instances, teachers would even tell parents not to teach their child at home because the child might become confused by differing methods.

It was the Coleman report on Equal Educational Opportunity (1966) and the numerous studies on freeing disadvantaged children that focused educators, psychologists, and sociologists on the critical role that the family plays in a child's successful participation in school and in adult society. Hess and Shipman (1966) in their study of maternal attitudes highlighted that the mother's feeling of powerlessness toward the school was negatively related to the child's tendency to engage in initiatory behavior in the Stanfod-Binet testing situation. Dodson defined the "Power Hypothesis" as stating that the child' view of his or her parents as powerless and uninvolved is related to the difficulty the school faces in developing active citizens among the poor. The challenge of involving parents who are not confident is not a new challenge faced only by microcomputer educators!

Philosophical Framework

Ira Gordon (1979), speaking to the Association for Supervision and Curriculum Development in 1978 said:

> What are some of the reasons for parent involvement? The basic reason is our belief that parent involvement enables children to achieve better and learn more. In other words, we assume that the behavior

> of parents and other family members influence child learning. The evidence is fairly wide spread based on longitudinal studies in England, international surveys of educational achievement, and a variety of sociological and psychological studies in the United States (p.4).

Almost all of the intervention studies conducted in the 60s were of the Parent Impact Model. They consisted of the teacher or visitor going into the home and presenting materials and methods to the parent (almost always the mother) to use in working with her young child or children. An analysis of these programs in 1977 indicated that as long as ten years after the programs ended, children were still doing better in school than children in the control group (Lazar, et al., 1977). At least part of the success must be attributed to increased motivation in children as a result of the improved self image of the family.

One criticism of this kind of program has been that it operates from a deficit model which assumes that parents lack basic skills in teaching the child and lack a general perception of themselves as teachers. Gordon felt the data supported the fact that these programs actually showed "a strong belief in the family and in the parents' ability to learn, to grow, to accept information and to use it for the family's good."

The success of parental involvement in Head Start led to the emergence of the Parent Education Follow Through Programs which promoted diverse parental roles: parent as observer or audience, parent as direct and active teacher of own child, parent as classroom volunteer, parent as adult learner, parent

as paid worker, and parent as decision maker. The goal was that all parents be genuine partners involved in all spokes of the wheel so it can turn.

(Insert Figure 1)

Individual parents because of need, skills, and desires will find certain spokes more desirable and interesting, but the key role is that of teacher of one's own child (Henderson, 1981).

Stearns has developed an excellent framework for studying the potential impact of parent involvement on chidren's achievement. She discusses three of the roles parents may play: tutors to their own children, paraprofessional employees, and decision makers, and then suggests that children do better because of improved self image, improved parent self image, and program adaptations brought about because parent perspectives influenced decisions. Her diagram outlines how the child's motivation to learn is affected by parent involvement (Safran, 1979).

(Insert Figure 2)

The question now presents itself: Can this same paradigm apply to computer education? What strategies can we

appropriate from these earlier approaches? Can parents achieve a degree of knowledge and competence with microcomputers which will give them self confidence and motivation and in turn transmit these qualities to their children?

The Challenge

The Computer Discovery Project at the Center for Young Children began to study the potential for using microcomputers with preschool children in the Spring of 1982. At that time the attitude of parents toward microcomputers ranged from fear and intimidation due to lack of knowledge and experience to curiosity and fascination. This statement from The Creative Kids' Guide to Home Computers echoes the sense of inadequacy felt by many parents and teachers. Speaking to the children, D'Ignazio (1981) states:

> Who will benefit from the new home computers? You will. Many older people still see computers as giant brains with plans to take over the world. Since they fear computers and distrust them, they are unprepared to learn how they work and take advantage of their marvelous talents. You, on the other hand, will work with computers in you own home, get to know them up close, and have the chance to learn what makes them work. (p.4)

Fortunately, not all authors addressed only the younger generation. Galanter (1983) in Kids and Computers, the Parents' Microcomputer Handbook, phrased the challenge as a joint venture:

> The stage is set for what I hope will be a lively and interesting introduction for you and your child to the new world of computing and computers...computers easily become the focus of activity for many aspects of family life. And unlike the TV, the computer is an interactive device. (p.14)

During the first few years that microcomputers were in the schools, educators were involved in defining the computer's role in the classroom and seldom focused on the issues parent educators like Ira Gordon were researching. With the advent of a plethora of violent and/or highly competitive video games, many of us began to realize that educators and parents alike needed to face the coming of the microcomputer in more profound and effective ways than we had dealt with the impact of television. In his article, "The Microcomputer: Don't Love It To Death", Ohles (1986) calls our attention to other products of technology which educators have hailed as powerful communication tools such as television, "an unmitigated disaster by overuse in the home, ... a disaster by default in the classroom". (p. 51) Will we, he asks, do with the microcomputer what we have done with the VCR, the teaching machine, and the TV, "over buy, under-use and eventually discard it?" (p. 53). Let us consider the thesis that educational tools are best implemented when homes and schools together define their purposes and do not allow the commercial producers to decide the role they will play. Such a relationship makes it possible for parents and teachers to play an important role in enhancing children's learning.

Home-School Communication Through Workshops

Because the staff at the Center for Young Children believes both parents and professionals benefit from an open network of communication, a series of parent workshops were initiated in the fall of 1983 to share with the parents the initial findings regarding young children's ability to interact with the microcomputer in a creative learning environment. The two session workshops were scheduled during the day and repeated in the evening to accommodate both working and non-working parents. The goals of the workshop were multiple: to acquaint the parents with the philosophy of the Center's use of microcomputers, to explain the scope and sequence of the children's involvement, to demonstrate hardware and software, to provide hands-on experience of the same kind that the children experince, to gather data on parents' attitudes and knowledge about microcomputers, and to encourage parental involvement in the program as volunteers in the classroom.

The 1983 workshops were well attended by both mothers and fathers and were repeated in the fall of 1984 and 1985. A comparison of the responses to the Attitude Questionnnaire in 1983 and 1985 suggests that parent support of the use of the microcomputer was strong to begin with and is increasing.

The following items are excerpted from the workshop questionnaire:

Statement 10 - I am pleased with the increasing use of computers in the schools.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1983	75%	17%	8%	--	--
1985	88%	6%	6%	--	--

Statement 11 - I am dismayed by the intrusion of technology in the schools.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1983	4%	4%	4%	29%	58%
1985	--	6%	6%	--	88%

Statement 4 - I would like to own a computer.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1983	71%	13%	13%	--	4%
1985	94%	--	--	6%	--

The results of the Workshop Attitude Questionnaire were verified by an Information Questionnaire sent to all the parents in the school. In 1983, only 3% of the parents owned microcomputers, 20% of the children were reported to be using microcomputers outside of the school setting, and 82% of the parents surveyed believed that their children would be using microcomputers in future school environments. In 1985, 51% of the parents owned microcomputers, 37% of the children were reported to be using microcomputers outside of the school setting, and 91% of the parents believed that their children would use them in future school settings. These statistics indicate a continuing conviction on the part of a group of predominantly upper middle class, educated parents that

microcomputers will be a long term teaching tool and an increasing commitment to placing them in the home.

Parental Concerns

Certain responses to the attitude questionnaire highlighted concerns that parents have about this new technology which they are accepting in their child's environment.

Statement 13 - Computers can promote social interaction in the classroom.

	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
1983	21%	8%	54%	13%	4%
1985	37%	37%	6%	6%	--

The parents at the workshop registered their highest concern about the social value of the microcomputer.

Observations reported by the University of Delaware computer camp staff (and a number of other research projects) support the notion that computers can promote prosocial behavior. "Children shared their growing knowledge with peers and parents who were less competent" (Ferrari et al, 1985, p.49). The report goes on to point out that teacher/learner roles at school and in the family may indeed be reversed as children teach their parents about the microcomputer. The social issue which computers may raise will not be one of isolation, as parents fear, but one of parents accepting the fact that they can learn with and from their children.

Statement 8 - Computers are fun to play with.

While 75% of the parents in both 1983 and 1985 agreed with this statement, 25% each year questioned or disagreed with it. It is significant to contrast the home usage of the microcomputer to school usage when considering this issue. In the classroom where it must be shared, the computer can be considered a scarce resource. At home, if it is available all the time, it can be considered a free resource. Levin (1981) reports observations of the computer in the home over a seven month period and points out that it became integrated into the work and play routines of the children. In one instance the computer served as a "Startrek control panel" for a complex fantasy involving planet exploration (p.4).

The importance of open ended tool use has been highlighted by Bruner (1972) who notes that "the critical evolution of tool using (through play activities) helps free the organism from the immediate requirements of his task" (p.698). In an unpressured environment the child can explore multiple solutions to problems he generates himself. One parent volunteer who owns his own computer reported that viewing the computer only in the classroom did not really demonstrate what his daughter could accomplish. "The microcomputer is better at home", he reported, "because there I can help Erin understand how to operate the program in the first 20-30 minutes. Then she is free to come and go and use it as she wishes. At school there are often other children waiting for a turn". Kee (1985) observes that whether innovative play behaviors will emerge in

the classroom will depend upon a) duration of use b) ratio of computers to children c) the nature of the resource, free or scarce and d) kinds of software activities supported (p.54).

Parents in the Classroom

Parents have served as volunteers in the Computer Discovery Project since its beginning, moving back and forth between the role of the adult learner and the teacher. Gradually they began offering more suggestions regarding the method of implementation and more critiques of software based on their own observations of the children. Evidence that parent volunteers grew in their understanding of the philosophy of the project was demonstrated most clearly when they began rejecting software which limited the children's choices and did not put them in command of the program.

However, the first real breakthrough in terms of parent initiative occurred in the spring of the third year and was directly related to the decision that parents could take the microcomputer home for the weekend. It was the parents who checked out the equipment and software who began to introduce more complex levels of the programs in the classroom. A typical comment was, "Oh, my children did that at home. I'm sure we can try it today". Parents who had previously hesitated to introduce a new program because they might make a mistake, became the risk takers, assuring the project director that their own child could help any one who had a problem. These same parents had in earlier weeks tried to limit the use of software to the simplest levels at which they felt most

confident. Now comfortable in their role as teacher they were able to encourage their children to be teachers too.

The excitement of the parents who discovered their own new expertise was contageous and led to the introduction of a new component in the project design- parent learning through weekend home loan. The prolonged period of computer usage allowed the parent, the child, and other family members to explore fully the programs to be introduced in the classroom. The parent who was the classroom volunteer developed individual teaching techniques by interacting with the family. Some parents, who had their own microcomputers, borrowed only the software. A few began to loan their software to the school and collaborative planning began in earnest. To date, neither equipment nor software has been damaged by this extended usage and much mutual learning has occurred.

The "Computer Weekend" Research Project

Named by one of the first participants in the pilot study, the "Computer Weekend" project was designed in recognition of the fact that parents are a significant and often overlooked group of software evaluators. The increase in volume of software available and the escalation of hard sell publicity that accompanies it has made it difficult for parents to choose which programs will enhance their children's learning. The project hopes to shed some light on the following questions:

Are there certain types of software that parents prefer? What programming features attract parents to a piece of

software?

Are the parents' understandings of how children acquire knowledge and skills reflected in the software they select?

Parents who participated in the pilot group were asked to try out six pieces of software related to Language Arts. The pieces were chosen to represent different teaching strategies and focus on convergent or divergent thinking. They were all targeted for children five to eight years of age. The pilot group of parents had some previous experience with computers and were thus skilled enough to run a program with reasonable documentation. Any program which proved difficult for the pilot group would be eliminated from further research. Furthermore, any program which was universally disliked would be eliminated as not of sufficient interest to parents.

When the study is conducted this summer, each family will be asked to use the programs for a weekend and then fill in an evaluation form on each piece of software. The parents will be asked to select from the twenty items on the form, the ten items they feel are important in selecting software for children and rank these items.

Although only six families have participated in the pilot project at this time, it is already very clear that opinions vary widely on the value of each piece of software. Parents who have chosen this school for their children knowing its stated philosophy express widely different preferences in how reading and writing skills and concepts are presented on the microcomputer. The one program that has received overall enthusiastic response from parents and children alike is the

Sierra- On Line adventure game. Winnie the Pooh in the Hundred Acre Wood (1985). Parents report that group participation in hunting for Pooh's friends' lost belongings has been high. One father who prefers basketball to computers admitted that he couldn't go to bed until he had located all ten items and delivered them to their owners. A third grade boy who dislikes reading was reported to do more purposeful reading in one weekend as he attended to Owl's clues than he often does in several weeks.

A second component of the research project will be the taping of parent child dyads at the end of the weekend. Each pair will interact for ten minutes with a piece of software that the child selects and one that the parent selects. The teaching style of each parent will later be studied and compared to the decisions they made in evaluating the software. It is hoped that this study will augment educators' insights into parent perceptions of software and help in the enhancement of a home-school team approach to software evaluation, home/school curriculum planning and mutual learning.

School/Community Outreach

While preparing this paper, the authors became aware of the work being done by EPIE Institute in collaboration with the Junior Mathematics, Engineering and Science Achievement program in a project called the Community-Classroom Computer Connection Program. The project director, Richard Wenn (1986), stresses that educators need to coordinate the use of home technologies with school activites and goals. The project targets two

issues: how can children's access to home computing be made more equitable and how can schools affect the quality of time children spend using computers at home. Working with three junior high schools in San Pablo, California, the project provides school workshops for parents and their children which equip them with the skills they need to use the computer equipment and software at home. They are then able to check out a computer for five weeks of home use. Early findings of the project indicate that many parents continue their own education along with their children and sign up for additional courses. Parents and children increase their ability to work together as a result of the computer experience. This project reflects many of the goals of the Follow Through programs, allowing parents to choose their spokes in the wheel. It also suggests an addition to the wheel- children as teachers. The project is in the process of preparing a development guide based on its work with parents.

A second project which exemplifies a real commitment to promoting computer equity and preventing a new level of illiteracy is the "Playing to Win" project. Founded by Antonio Stone and located in New York City, this funded project offers computer experience at correctional facilities, public libraries, and to parents and children living in lower socio-economic housing in East Harlem. Each participant in the project is interviewed to ascertain what his or her interests are. Individuals or family groups can obtain membership in the Playing to Win project and sign up to take courses and use the thirty to forty available microcomputers.

> The idea is simple: computers are fun. Computers can open doors to learning and to job skills. Early on, Playing To Win found that lessons in the guise of games captivated even the most disillusioned learner...Today, Playing to Win's computer projects are developing creativity in young writers and artists through word processing and graphics software. Imaginative simulations send students to the moon, under the sea, through the anatomy of the frog, and across the world while they sit at the computers (Stone, 1985).

Encouragement and easy access promote maximum involvement of people of all ages, races, and social positions. The project has produced a set of six "tip sheets" available to those who are interested in various aspects of community action for computer equity.

Conclusions

Each of the interactions described in this discussion have one thing in common. They all involve the challenge of promoting interaction across generation and role divisions and acceptance of the new technology, the microcomputer, as one which can equalize and educate groups of learners. Because it is intriguing to most people, the microcomputer can serve as a magnet to attract those who might otherwise not find their spoke in the wheel of continuing education. The equity issue is one which is of constant concern, its importance increasing as we become aware that the microcomputer offers a powerful way for children and adults to explore problems and process information. It is encouraging to learn of programs that are

actively experimenting with models that can address the challenge. Our ability to solve the problem must lie in sharing our findings. Wenn proposes a functional network of school and community educators who have worked with what he calls "community computing programs".

Choosing the model that best addresses each situation is no simple task. The particular methods are more a matter of adapting a number of options to the needs of a particular group of families and schools. With powerful data bases and growing expertise in telecommunication, it should be possible to maximize our learning as we address the challenge of creating a dynamic interactive home-school-community connection.

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